FIG. 1

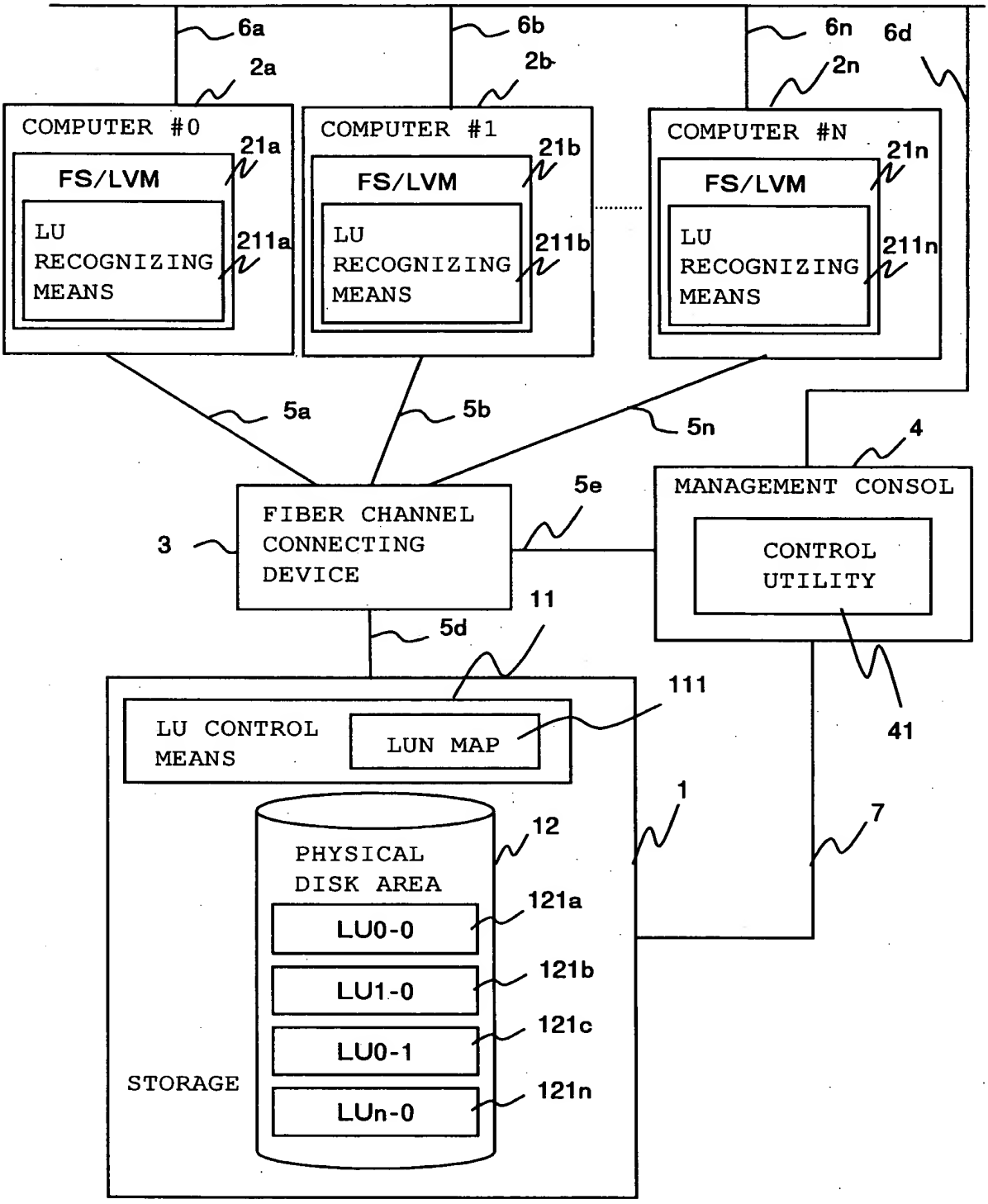
6a
6b
6n
6d
2a
2b
2n
COMPUTER #0
COMPUTER #1
COMPUTER #N
21a
21b
21n
FS/LVM
LU RECOGNIZING MEANS
211a
211b
211n
5a
5b
5n
4
MANAGEMENT CONSOL
CONTROL UTILITY
5e
3
FIBER CHANNEL CONNECTING DEVICE
11
5d
111
LU CONTROL MEANS
LUN MAP
41
1
7
12
PHYSICAL DISK AREA
121a
LU0-0
121b
LU1-0
121c
LU0-1
121n
LUn-0
STORAGE

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FIG. 2

111

PORT NUMBER	TARGET ID	OUTER LUN	LUN COMBING INFORMATION	INNER LUN	TOP LBA	THE NUMBER OF BLOCK	WWN	S_ID	PROPERTY
0	0	0	1-1	0	0	1048576	WWNa	S_IDa	EXCLUSIVE
0	0	0	1-1	1	0	1310720	WWNb	S_IDb	EXCLUSIVE
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	0	1-1	n-1	0	917504	WWNn	S_IDn	EXCLUSIVE
0	0	1	1-1	k	0	2359296	WWNa	S_IDa	COMMOMN
0	0	1	1-1	k	0	2359296	WWNb	S_IDb	COMMOMN
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0	0	1	1-1	k	0	2359296	WWNn	S_IDn	COMMOMN

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FIG. 3

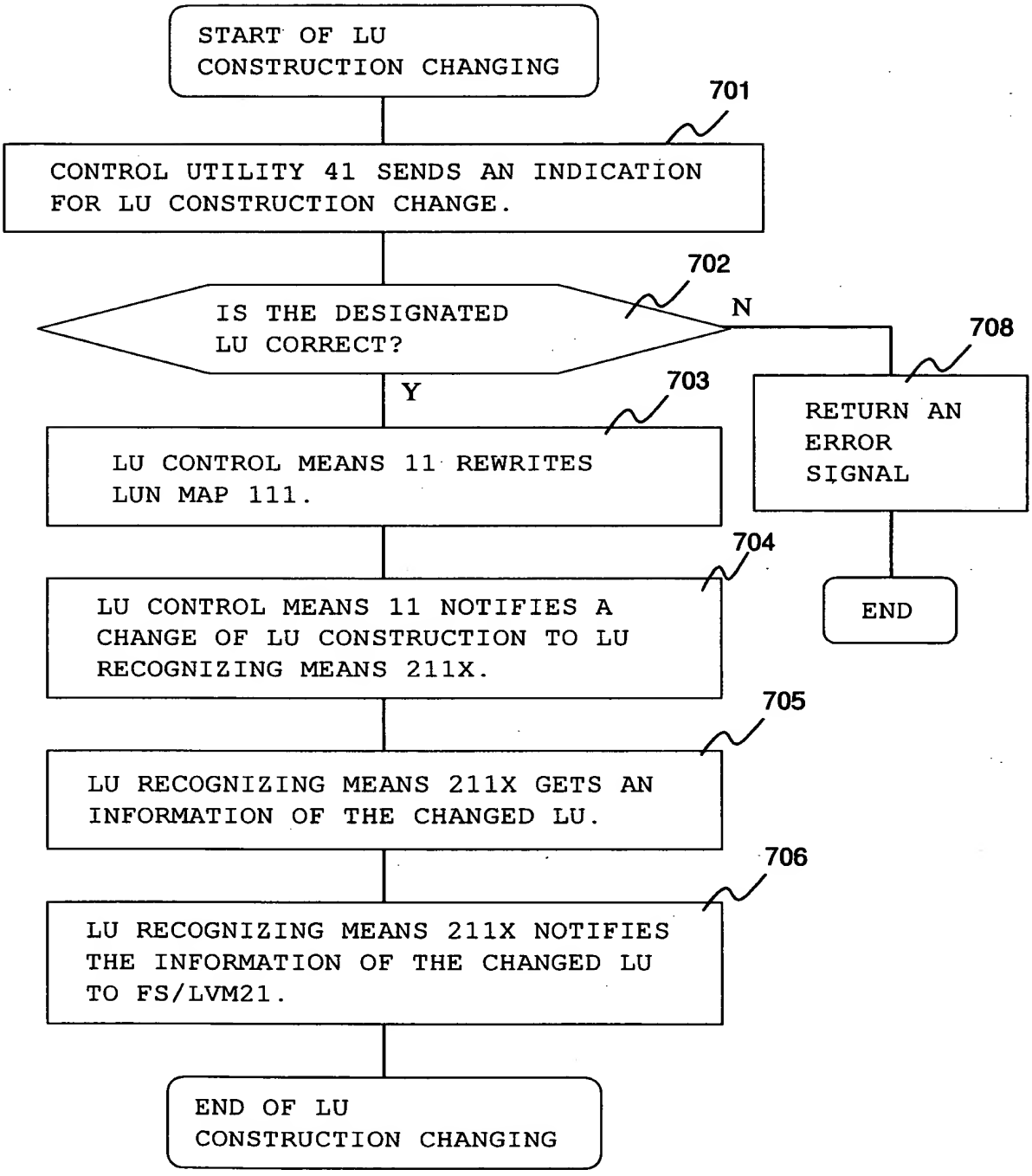


FIG. 4

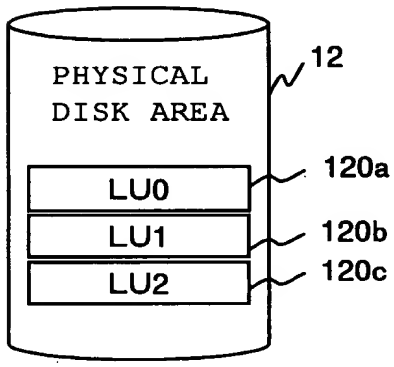
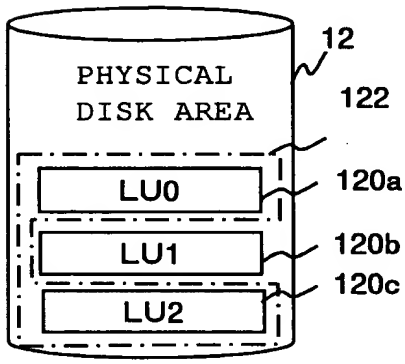

PHYSICAL
DISK AREA
12
LU0
LU1
LU2
120a
120b
120c

FIG. 7


PHYSICAL
DISK AREA
12
122
LU0
LU1
LU2
120a
120b
120c

T0C2C0 "551D1660

FIG. 5

111

PORT NUMBER	TARGET ID	OUTER LUN	LUN COMBING INFORMATION	INNER LUN	TOP LBA	THE NUMBER OF BLOCK	WWN	S_ID	PROPERTY
0	0	0	1-1	0	0	80000	WWNa	S_IDa	EXCLUSIVE
0	0	0	1-1	1	0	90000	WWNb	S_IDb	EXCLUSIVE
—	—	—	—	2	—	70000	—	—	—
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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FIG. 6A

111

PORT NUMBER	TARGET ID	OUTER LUN	LUN COMBING INFORMATION	INNER LUN	TOP LBA	THE NUMBER OF BLOCK	WWN	S_ID	PROPERTY
0	0	0	2-1	0	0	80000	WWNa	S_IDa	EXCLUSIVE
0	0	0	1-1	1	0	90000	WWNb	S_IDb	EXCLUSIVE
—	—	—	2-2	2	80000	70000	—	—	—
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

FIG. 6B

111

PORT NUMBER	TARGET ID	OUTER LUN	LUN COMBING INFORMATION	INNER LUN	TOP LBA	THE NUMBER OF BLOCK	WWN	S_ID	PROPERTY
0	0	0	3-1	0	0	80000	WWNa	S_IDa	EXCLUSIVE
0	0	0	1-1	1	0	90000	WWNb	S_IDb	EXCLUSIVE
—	—	—	3-2	2	80000	70000	WWNa	S_IDa	EXCLUSIVE
—	—	—	3-3	5	150000	100000	WWNa	S_IDa	EXCLUSIVE
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

FIG. 6C

111

PORT NUMBER	TARGET ID	OUTER LUN	LUN COMBING INFORMATION	INNER LUN	TOP LBA	THE NUMBER OF BLOCK	WWN	S_ID	PROPERTY
0	0	0	3-1	0	0	80000	WWNa	S_IDa	EXCLUSIVE
0	0	0	1-1	1	0	90000	WWNb	S_IDb	EXCLUSIVE
—	—	—	3-2	5	80000	100000	WWNa	S_IDa	EXCLUSIVE
—	—	—	3-3	2	180000	70000	WWNa	S_IDa	EXCLUSIVE
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

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FIG. 8

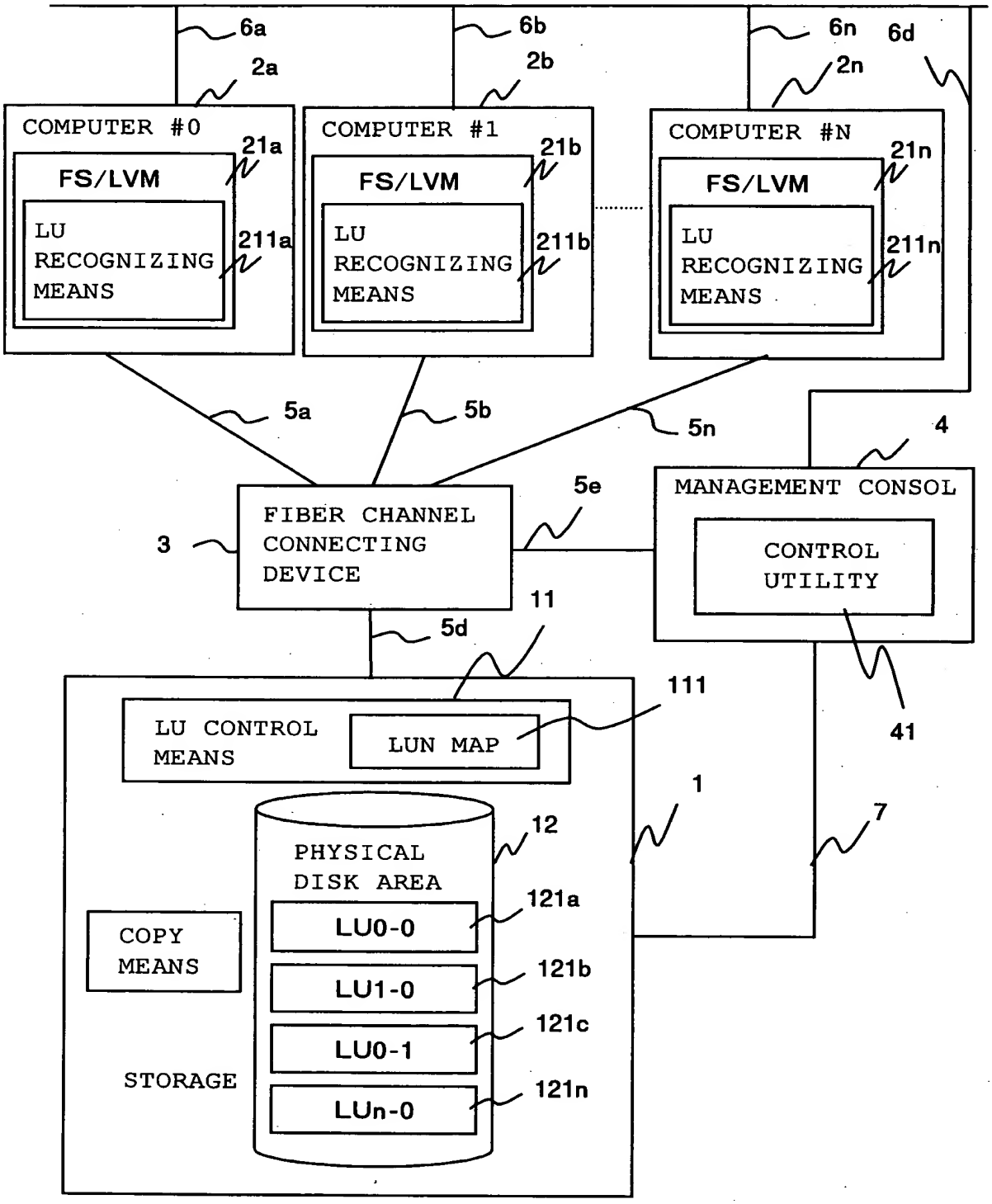

6a
6b
6n
6d
2a
2b
2n
COMPUTER #0
COMPUTER #1
COMPUTER #N
21a
21b
21n
FS/LVM
FS/LVM
FS/LVM
LU RECOGNIZING MEANS
LU RECOGNIZING MEANS
LU RECOGNIZING MEANS
211a
211b
211n
5a
5b
5n
4
5e
MANAGEMENT CONSOL
3
FIBER CHANNEL CONNECTING DEVICE
CONTROL UTILITY
11
5d
111
LU CONTROL MEANS
LUN MAP
41
1
7
12
PHYSICAL DISK AREA
121a
COPY MEANS
LU0-0
121b
LU1-0
121c
LU0-1
STORAGE
121n
LUn-0

FIG. 9

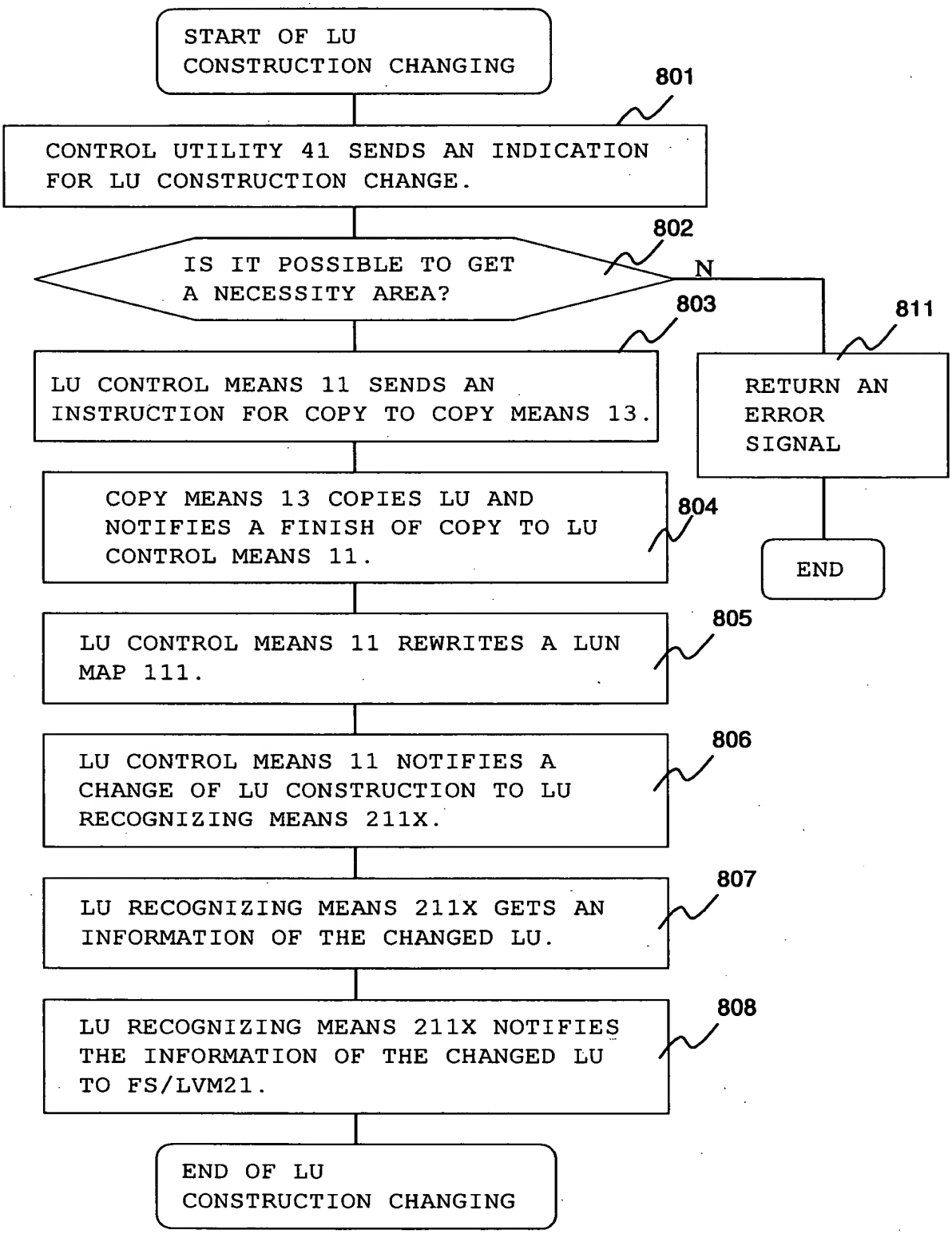

START OF LU CONSTRUCTION CHANGING
801
CONTROL UTILITY 41 SENDS AN INDICATION FOR LU CONSTRUCTION CHANGE.
802
IS IT POSSIBLE TO GET A NECESSITY AREA?
N
811
RETURN AN ERROR SIGNAL
END
803
LU CONTROL MEANS 11 SENDS AN INSTRUCTION FOR COPY TO COPY MEANS 13.
COPY MEANS 13 COPIES LU AND NOTIFIES A FINISH OF COPY TO LU CONTROL MEANS 11.
804
LU CONTROL MEANS 11 REWRITES A LUN MAP 111.
805
LU CONTROL MEANS 11 NOTIFIES A CHANGE OF LU CONSTRUCTION TO LU RECOGNIZING MEANS 211X.
806
LU RECOGNIZING MEANS 211X GETS AN INFORMATION OF THE CHANGED LU.
807
LU RECOGNIZING MEANS 211X NOTIFIES THE INFORMATION OF THE CHANGED LU TO FS/LVM21.
808
END OF LU CONSTRUCTION CHANGING

FIG. 10A

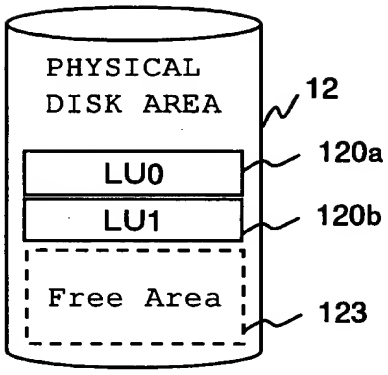


FIG. 10B

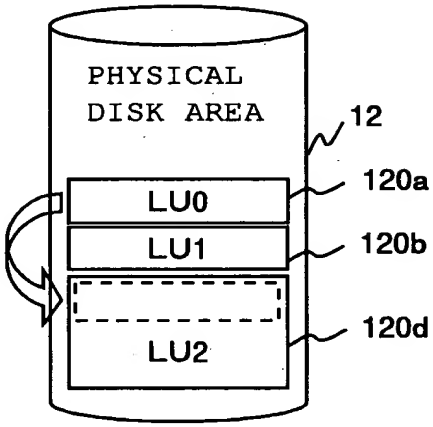
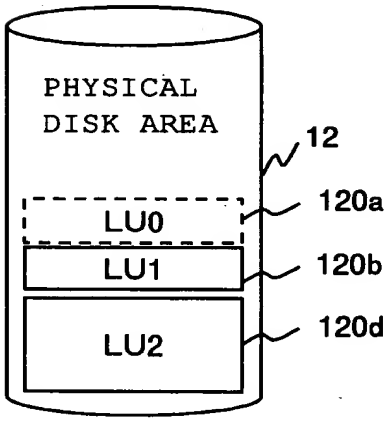


FIG. 10C



T00220 "ES10T660

FIG. 11

111

PORT NUMBER	TARGET ID	OUTER LUN	LUN COMBING INFORMATION	INNER LUN	TOP LBA	THE NUMBER OF BLOCK	WWN	S_ID	PROPERTY
0	0	0	1-1	0	0	80000	WWNa	S_IDa	EXCLUSIVE
0	0	0	1-1	1	0	90000	WWNb	S_IDb	EXCLUSIVE
—	—	—	—	—	—	—	—	—	—
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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FIG. 12

111

PORT NUMBER	TARGET ID	OUTER LUN	LUN COMBING INFORMATION	INNER LUN	TOP LBA	THE NUMBER OF BLOCK	WWN	S_ID	PROPERTY
–	–	–	–	0	–	80000	–	–	–
0	0	0	1-1	1	0	90000	WWNb	S_IDb	EXCLUSIVE
0	0	0	1-1	2	0	180000	WWNa	S_IDa	EXCLUSIVE
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

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FIG. 13

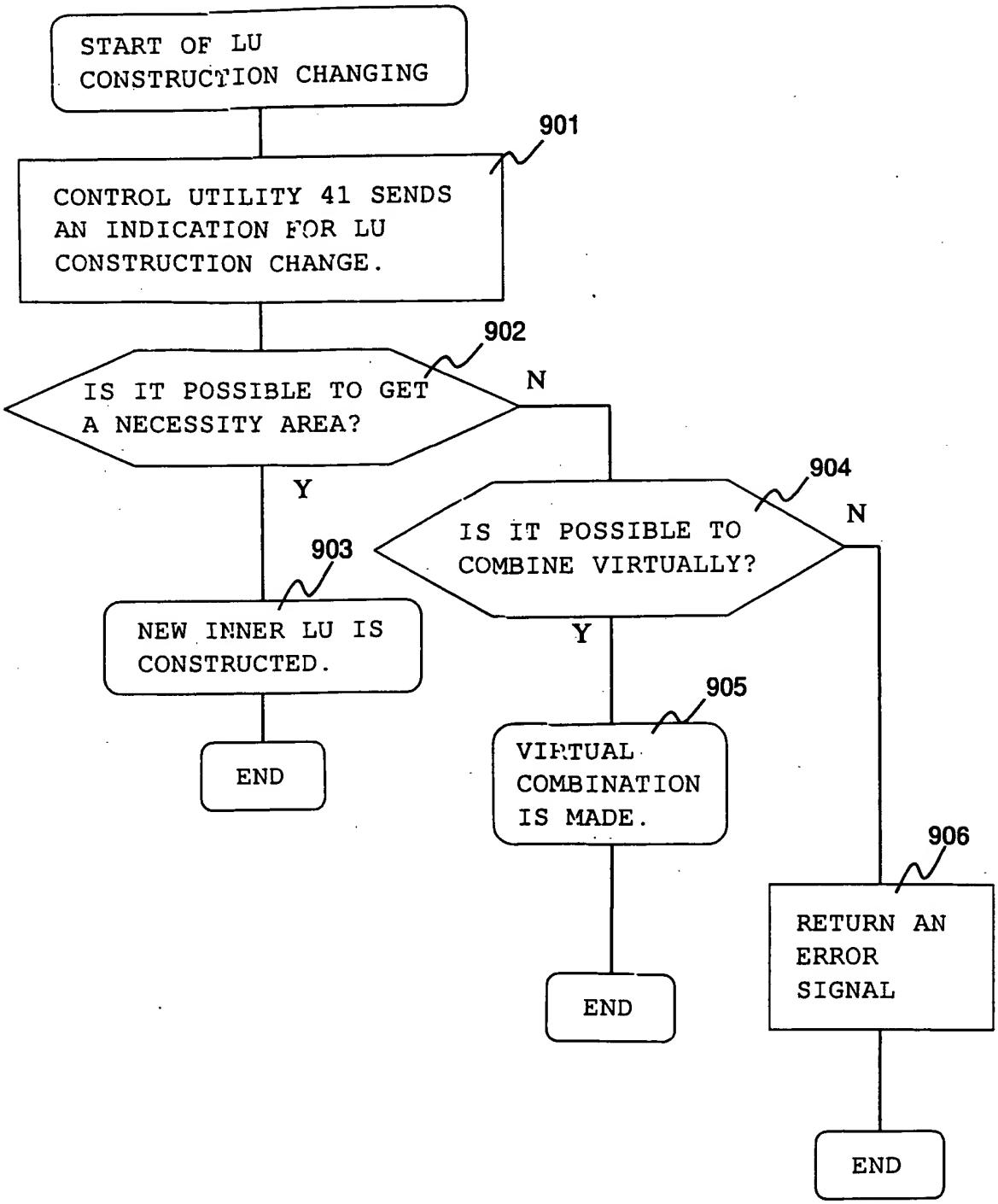

START OF LU CONSTRUCTION CHANGING
901
CONTROL UTILITY 41 SENDS AN INDICATION FOR LU CONSTRUCTION CHANGE.
902
IS IT POSSIBLE TO GET A NECESSITY AREA?
N
Y
903
NEW INNER LU IS CONSTRUCTED.
END
904
IS IT POSSIBLE TO COMBINE VIRTUALLY?
N
Y
905
VIRTUAL COMBINATION IS MADE.
END
906
RETURN AN ERROR SIGNAL
END

FIG. 14A

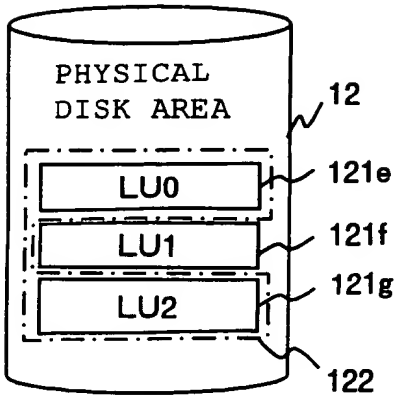


FIG. 14B

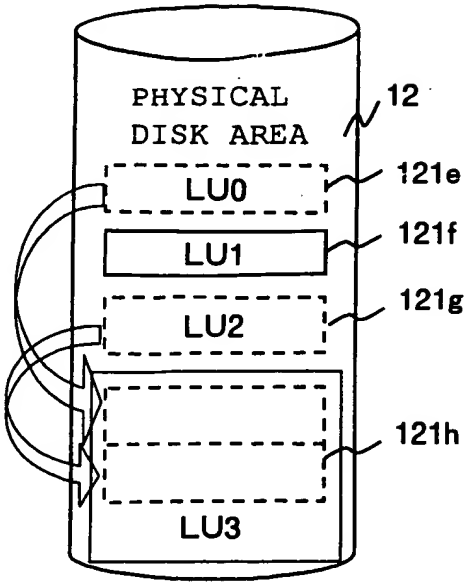
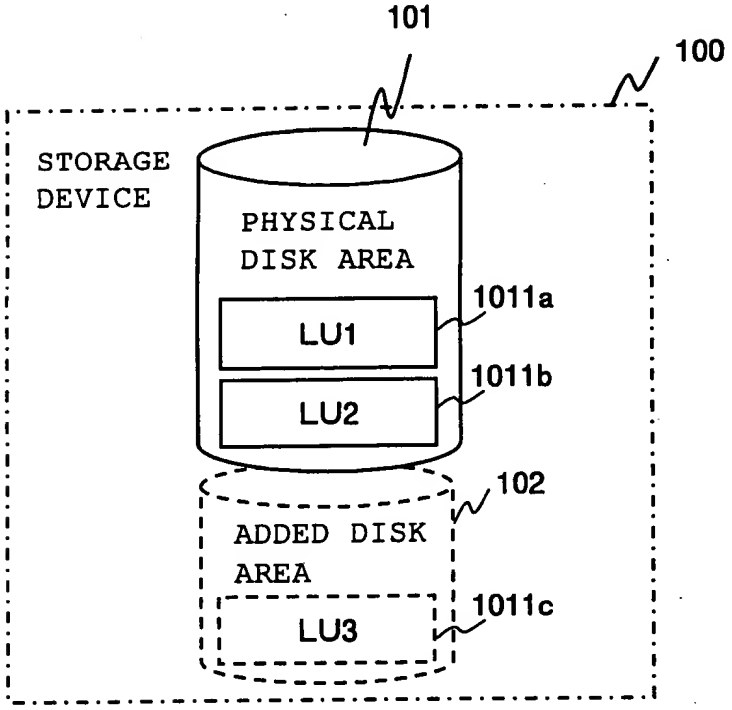


FIG. 15


101
100
STORAGE DEVICE
PHYSICAL DISK AREA
LU1
1011a
LU2
1011b
102
ADDED DISK AREA
LU3
1011c